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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Hi-bu 991458wo	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP99/06494	International filing date (day/month/year) 03 September 1999 (03.09.99)	Priority date (day/month/year) 08 September 1998 (08.09.98)
International Patent Classification (IPC) or national classification and IPC G06K 11/18		
Applicant GMD FORSCHUNGSZENTRUM INFORMATIONSTECHNIK GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

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Date of submission of the demand 15 March 2000 (15.03.00)	Date of completion of this report 16 August 2000 (16.08.2000)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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## I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

- ☐ the international application as originally filed.
- ☒ the description, pages 1-9, as originally filed,  
pages \_\_\_\_\_, filed with the demand,  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. 1-14, as originally filed,  
Nos. \_\_\_\_\_, as amended under Article 19,  
Nos. \_\_\_\_\_, filed with the demand,  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig 1-2, as originally filed,  
sheets/fig \_\_\_\_\_, filed with the demand,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

### 2. Citations and explanations

This report refers to US-A-5 729 249 as D1.

#### **Novelty, inventive step and industrial applicability**

1. The application **relates to** a so-called "three-dimensional" mouse, i.e. an input device that can be moved in space. Sensors recognize this movement and control an output device, on the screen of which a displayed object follows the movements in space.

A similar device is known from D1 (cited in the application). In that document, a cube is equipped with pressure-sensitive sensors on its six sides which measure the hand and finger movements of the user.

A sensor according to D1 can be rotated as a whole in order to rotate the displayed object. The cube is rotated, for example, 90 degrees to the right from its starting position in order to rotate the object. If the cube is then moved upwards in order to lift the object, the **problem** arises that the coordinate systems of the cube and the output device are now twisted. An upward movement of the cube is

misinterpreted as a movement towards the left. Thus the arrangement and orientation of the actuating organs of the input device do not match the directions in which the object can be moved by the organs.

2. The **solution** consists in equipping the input device with its own position-sensing mechanism which detects the position of the cube (for example, inertia or orientation sensor). This additional sensor is sensitive to the three spatial axes and ensures that the change in the image on the display which is expected by the user is also actually made. After the cube has been rotated (to rotate the object), the coordinate system is modified by this sensor in such a way that a movement of the cube, for example, upwards, then also causes the displayed object to move upwards.
3. D1, which is cited in the application and is also the only **document** cited in the international search report, does not suggest an additional sensor of this type and the translation of the coordinate systems. A rotation of the entire cube does not appear to take place in D1; in order to rotate the object in D1, the user must rub in opposite directions on two opposing sides of the cube (see, for example, Figure 33e in D1).

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## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

### **Certain defects in form or content (PCT Rules 5 to 7)**

1. The independent claims have not been drafted in the two-part form.
2. The description has not been brought into line with the claims (PCT Rule 5.1a).
3. **Claim 6** contains an incorrect reference sign ("y, y, z").
4. PCT Rule 11.8 has not been met.

## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**Clarity, conciseness, support by the description** (PCT Article 6)

1. The requirement of conciseness has not been met, since there are too many independent claims. **Claim 4** is directed to the solution with two actuating organs per axis, whereas Claim 1 defines only one displaceable actuating organ per axis. In light of Claim 5 ("in their directions of displacement"), which is dependent on Claims 1 and 4, it appears as though the actuating organs must also be displaceable in Claim 4. If this is not the case, then the wording in Claim 5 is unclear.
2. It is essential to the invention (see description, page 1, bottom three lines) that the direction in which the actuating organ on the input device is moved is exactly the same as the direction in which the display device moves the displayed object (see page 4, second paragraph). A corresponding feature is missing in the independent claims. Presently, the claims also cover the situation when, for example, the actuating element is moved in the X-direction, whereas the display device shows a movement in the Z-direction.

The independent claims are missing a feature which clarifies the correction which takes place when the entire input cube is rotated in order to ensure that, in any position of the cube, for example, an upward movement of the cube also causes the displayed object

## VIII. Certain observations on the international application

to move upwards. Without a correction device of this type, the invention does not solve the specified problem.

3. The wording "input device for control signals" at the beginning of **Claims 1 and 4** is unclear. Does the input device produce the control signals or are control signals fed into the input device (controlling the input device by means of control signals, input of control signals)?
4. The text from "and within" to "projects" ["und innerhalb" to "vorsteht" in the original German] in lines 9-11 of **Claim 1** is grammatically incorrect and incomprehensible.
5. The word "the" ["der" in the German text] in line 12 of **Claim 1** is unclear. The same applies to **Claim 4**.
6. Features following the words "in particular" (for example, **Claims 1 and 11**) do not have a limiting effect and are therefore misleading.
7. **Claim 2** is missing the word "are" ["sind" in the German text].
8. **Claim 11** does not meet the requirement of conciseness (end of line 3 and into line 4).
9. **Claim 12** may not be dependent on Claim 11, since otherwise a contradiction arises (cubic/spherical form). The same applies to **Claim 13**.

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## VIII. Certain observations on the international application

10. **Claim 14** is worded as a dependent claim. That claim relates to a graphic display system. The actual characterizing features (see the two last lines of Claim 14), however, define the input device, but not the (claimed) display system. The claim is therefore misleading. It is unclear, for example, whether the input device belongs to the claimed subject matter. It should also be noted that the subject matter of this claim appears to correspond to that of the two independent claims. Furthermore, it is not sufficiently clear that **Claim 14** is a dependent claim. The text on page 3 (after the empty line) is misleading: The invention relates to the input device, not the display device.
11. The meaning of the last line on page 9 is unclear. The invention is defined only by the wording to the claims.